

REMARKS

The following remarks are submitted to address the above amendments and issues raised in the Official Action mailed March 9, 2004.

Following entry of the amendments above, claims 1-2, and 4-29 are pending in this application. Claims 1, 2, and 4-29 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Claims 1, 2, and 4-29 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

These amendments are made merely to clarify the subject matter of this application. No new matter has been added. Support for requested amendments can be found in the original claims and throughout the present specification and drawings. Applicant respectfully requests consideration of the application in light of the above amendments and the following remarks.

Summary of Interview

Applicant thanks Examiner Marschel for the telephonic interview on May 11, 2004, conducted with the Applicant, Ms. Boehm, and the undersigned Applicant's attorney (together referred to as "Applicant"). Following is a summary of the interview.

The rejections under 35 U.S.C. § 112, second paragraph, relating to whether the methods are meant to be limited to a "therapeutic" use in a patient as implied in the claim preambles or as recited in the steps of the claims was discussed. Applicant pointed out that the application discloses use of the claimed methods in environments other than a patient. For example, methods for determining resonant frequencies of electromagnetic radiation for influencing a target material can be carried out in animals other than humans and in food, water, and agricultural settings. It was agreed that removing the word "therapeutic" from the claims would resolve this issue.

The rejections under 35 U.S.C. § 112, first paragraph, relating to whether calculation of a wavelength and a resonant frequency are enabled was discussed. The examiner stated that he considers the invention to include determining a first resonant frequency of a genomic material, and utilizing that frequency to determine a second resonant frequency. The examiner stated two bases for this rejection. The first basis for rejection is that genomic material is complex. The examiner pointed out that determination of a frequency involves more than just calculation of a wavelength, for example, factors such as antenna characteristics. Applicant stated that such factors, including, for example, a linear or coiled configuration of genomic material, are sufficiently addressed for the claimed methods to selectively influence a target genomic material in a desired manner.

The second basis for rejection is that, while the invention contemplates “resonance,” use of frequencies determined by the claimed methods may not achieve “resonance.” In particular, the examiner finds no demonstration of such frequencies resonating with a target genomic material. The examiner stated that in order for the claims to be enabled, there should be a demonstration that, if frequencies determined by the claimed methods are used, resonance is achieved with some degree of predictability. Applicant pointed out that, based on numerous field demonstrations, a frequency-emitting device programmed with frequencies determined according to the claimed methods selectively influence a target genomic material in a desired manner. As such, the claimed methods provide predictability.

Claims 1, 2, and 4-29—35 U.S.C. § 112, Second Paragraph

The rejections of claims 1, 2, and 4-29 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention, are respectfully traversed.

Claims 1, 15, 17, and 28, as amended, claim “[a] method for determining resonant frequencies of electromagnetic radiation for influencing [a target genomic material or atomic and molecular particles] . . .”

The Official Action states that in claim 1, line 1, the method is directed to determining therapeutic resonant frequencies thus indicating that the resonance is meant to be utilized during therapeutic procedures, that such procedures apparently will be administered to a patient, and that none of the determinations of frequencies in the actual method steps are directed to patient parameters. The Official Action states that electromagnetic radiation with the therapeutic frequencies are well known to be influenced by the medium in which it is traveling, both in velocity and wavelength, and that, for example, solid, semi-solid, or liquid media support a different velocity of electromagnetic radiation depending on its exact content. The Official Action states that it is unclear whether the preamble controls the metes and bounds of the claims wherein the method would be limited to performance inside of a patient or whether unlimited determinations of wavelength etc. are meant as in the claim steps, and that clarification via clearer claim wording is requested. (Official Action, pages 2-3.)

Applicant respectfully submits that the descriptive term “therapeutic” has herein been deleted from the preamble of the four independent claims. As discussed in the interview on May 11, 2004, deletion of the word “therapeutic” is consistent with the disclosure that these claims can apply to environments other than a patient. For example, a method for determining resonant frequencies of electromagnetic radiation for influencing a target genomic material or atomic and molecular particles can be carried out in animals other than humans and in food, water, and agricultural settings. Therefore, deleting the word “therapeutic” from the preamble of these claims clarifies that the preambles do not limit the methods to performance inside a patient. Accordingly, Applicant respectfully submits that claims 1, 15, 17, and 28 particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Claims 2, 4-14, 16, 18-27, and 29 depend from claims 1, 15, 17, and 28, and as such, particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

For all of these reasons, the Office is respectfully requested to withdraw the rejections of claims 1, 2, and 4-29 under 35 U.S.C. § 112, second paragraph.

Claims 1, 2, and 4-29— 35 U.S.C. § 112, First Paragraph

The rejections of claims 1, 2, and 4-29 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, are respectfully traversed.

Claims 1 and 15, as amended, claim “[a] method for determining resonant frequencies of electromagnetic radiation for influencing a target genomic material . . . determining a wavelength of the genomic material . . . determining a first resonant frequency of the genomic material . . . [determining] a second resonant frequency in another electromagnetic frequency range . . . and selectively influencing the target genomic material with the second resonant frequency . . .”

Claims 17 and 28, as amended, claim “[a] method for determining resonant frequencies of electromagnetic radiation for influencing atomic and molecular particles . . . determining a wavelength of the particle . . . determining a first resonant frequency of the particle . . . [determining] a second resonant frequency in another electromagnetic frequency range . . . and selectively influencing the target particle with the second resonant frequency . . .”

The Official Action states that the claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Official Action lists the *In re Wands* factors to be considered in determining whether undue experimentation is required as: (1) the quantity of experimentation necessary; (2) the amount or direction presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. (Official Action, page 3.)

The Official Action states that *the wavelength value* utilized in the claimed invention for determination of frequencies lacks enablement. The Official Action states that although the claims indicate that the wavelength of the genomic material is either a known quantity or

determined via utilizing the average spacing of base pairs of nucleic acid (which has been previously determined for a highly purified nucleic acid), the receiving of electromagnetic radiation is based on a genomic material form which is very complex. For example, in living cells, nucleic acid may contain histones, proteins, and RNAs; the DNA molecules may be “enormous” and packed into a relatively small volume in a nuclear zone; a chromosome is convoluted and may be supercoiled; and a cell may have more than 10^9 base pairs. (Official Action, page 4 (emphasis added).)

The Official Action also states that electromagnetic radiation can be received by radio system antennas, and that radiation absorption in the claimed invention is influenced by antenna dynamics. The Official Action points out that antenna characteristics are complex, being influenced by variables such as the difference between “electrical length” and physical length of a receiving material, the length/diameter ratio of the receiving material, coupling effects in closely packed receiving material, polarizations effects, and absorption patterns in “loop” antennas (such as would characterize bacterial genomic material). (Official Action, pages 5-6.)

The Official Action states that the simplistic wavelength calculation set forth in the claims ignores these complexities even if genomic material were linear but particularly in genomic material in complex nuclear regions of cells. The Official Action states that it would require undue experimentation to determine a wavelength for genomic material in a therapeutic setting, which prevents the determination of wavelength with any reasonable accuracy for the practice of the claimed invention. (Official Action, page 6.)

The Official Action further states that *a resonant frequency calculation* as set forth in the claims requires such a wavelength determination, and thus equivalently lacks enablement without undue experimentation. (Official Action, page 6 (emphasis added).)

Applicant respectfully submits that determination of a wavelength in the present invention is based on *length* of a genomic material, whether the material is linear or coiled in its

natural configuration or whether other potential variables exist. As pointed out in the present specification, “the length of any object can be considered as having a resonant frequency by virtue of correlation with a wavelength that manifests itself into a surrounding medium. On that basis, the length of biomolecular chains of DNA and RNA can be measured and thus can provide wavelength information unique to a specific strand of genomic material.” (Present specification, page 5, lines 8-13.) In particular, the *length* of an antenna will largely determine how effectively the antenna responds to the wavelength energy of an incoming transmission. Methods for determining resonant frequencies of the present invention utilize the principle that the *length* of a DNA or RNA helical chain can be electromagnetically resonated in similar fashion. (Present specification, page 6, lines 10-13 (emphasis added).)

The complexity of genomic material in a living cell is addressed in the step of determining a wavelength of the genomic material “by determining the number of base pairs in the genomic material and multiplying the number of base pairs by the known value for the average spacing between base pairs”, as in claims 1 and 15. The complexity of atomic and molecular particles in a living cell is addressed in the step of “determining a wavelength of [atomic or molecular particles] by dividing Plank’s constant by the product of the mass of the particle and the speed of light”, as in claims 17 and 28. Therefore, calculating a wavelength utilizing the known average spacing of base pairs of nucleic acid or the known values for Plank’s constant and the speed of light, any variables related to biological configuration and/or radiation absorption characteristics are standardized. As a result, the present invention eliminates, or significantly reduces, any experimentation for determining resonant frequencies of electromagnetic radiation for influencing a target genomic material and/or atomic and molecular particles.

The present specification provides direction for practicing the claimed invention in the several, detailed working examples. In particular, the specification provides all calculations for determination of wavelengths in various media and first and second resonant frequencies for the DNA genome of *Borrelia burgdorferi*. The specification provides discussion related to how to

determine frequencies for programming a frequency-emitting device for *Borrelia burgdorferi*. (Present specification, page 13, line 9 – page 15, line 8; page 15, line 19 – page 17, line 14; page 18, line 15 – page 20, line 3.) The present specification provides calculations for determination of wavelength and first and second resonant frequencies for the *Rubella* measles RNA virus. (Present specification, page 20, lines 4-12.) The present specification provides further examples of the claimed methods for genes and gene sections, and for calculations for determination of wavelength and first and second resonant frequencies for atomic and molecular particles, for example uranium-238. (Present specification, page 21, line 7 – page 23, line 14; page 23, line 16 – page 25, line 16.)

With respect to predictability of the present invention, as the examiner points out, the Board of Patent Appeals and Interferences has stated that although the level of skill in molecular biology is high, the results of experiments in genetic engineering are unpredictable. (Official Action, page 3.) However, the present invention enhances predictability for programming a frequency-emitting device for influencing target genomic material and/or atomic and molecular particles by providing a method for accurately and efficiently calculating multiple frequencies (including harmonic and sub-harmonic frequencies) for this purpose.

Therefore, Applicant respectfully submits that *the wavelength value* utilized in the claimed invention for determination of frequencies is enabled, and that determination of wavelength with any reasonable accuracy for the practice of the claimed invention thus does not require undue experimentation. Consequently, the wavelength determination for *calculating a resonant frequency* as set forth in the claims is likewise enabled without undue experimentation.

In addition, in the interview on May 11, 2004, the examiner stated that in order for the claims to be enabled, there should be a demonstration that, if frequencies determined by the claimed methods are used, resonance is achieved with some degree of predictability. Applicant respectfully submits that, based on numerous field demonstrations, a frequency-emitting device programmed with frequencies determined according to the claimed methods selectively influence

a target genomic material in a desired manner (whether or not “resonance” of the genomic material is achieved). (*See* present specification, page 20, line 13 – page 21, line 5.) As such, the claimed methods provide predictability. Moreover, claims 1, 15, 17, and 28, as amended, claim “[a] method for determining resonant frequencies of electromagnetic radiation for influencing [a target genomic material or atomic and molecular particles]” Applicant respectfully submits that the claims of the present invention are directed to determining a first resonant frequency, determining a second resonant frequency based on the first frequency, and selectively influencing a target material using the second frequency, rather than to a particular resonance event. Thus, the predictability of achieving “resonance” is not a factor influencing enablement of the claimed invention.

Accordingly, Applicant respectfully submits that the specification describes the subject matter in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, as set forth in claim 1, 15, 17, and 28. As such, a person skilled in the art would be enabled to make/use the invention commensurate with the scope of these claims. Claims 2, 4-14, 16, 18-27, and 29 depend from claims 1, 15, 17, and 28, and as such, are likewise enabled by the specification.

For all of these reasons, the Office is respectfully requested to withdraw the rejections of claims 1, 2, and 4-29 under 35 U.S.C. § 112, first paragraph.

CONCLUSION

Applicant submits that a full and complete response has been made herein to the Official Action and, as such, all pending claims in this application are now in condition for allowance. Therefore, Applicant respectfully requests early consideration of the present application, entry of all amendments herein requested, withdrawal of all rejections, and allowance of all pending claims.

The Office is respectfully invited to contact J. Michael Boggs at (336) 747-7536, to discuss any matter relating to this application.

Respectfully submitted,

5/9/04
Date



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